Catalog Archive Server

Functional and Technical Requirements

SDSS

Outline

- Functional Goals
  - Query Constraints
  - Scope of Queries
  - Types of Queries
  - Proximity and Nested queries
  - Metadata Queries
- Technical Goals
  - User Interface
  - Standardized Data Access
  - Distributability
  - Security

Functional Goals

- Query Constraints
- Scope of Queries
- Types of Queries
- Proximity and Nested queries
- Metadata Queries

Query Constraints

- Efficient queries over following constraints:
  - Ranges of longitude or latitude in several coords
    - J2000 RA and Dec
    - Galactic and Survey coordinates
    - Any linear combination of the two coordinates
  - Radial (cone) search
  - Linear combination of mags, surface brightness
  - Object size, classification, type
  - Target Selection category
  - Existence of spectrum
  - Status and Photo Flags

Scope of Queries

- Queries on any retained parameter
- For all efficient queries, return an estimated number of objects to be located
  - Count(*) SQL construct
- For all located objects, users shall be able to specify an arbitrary subset of stored parameters to be returned plus the number of located objects
  - SELECT * FROM …
  - SELECT TOP <n> * FROM …

Proximity & Nested Queries

- Proximity queries
  - e.g, get all objects within given distance of each of 10,000 QSOs in my favorite catalog
  - CrossID, SpecList queries
- Formulate new queries based on results of previous queries
  - CasJobs (batch access, MyDB space)
  - Nested queries

Metadata Queries

- List of tables
- List of attributes
- List of enumerated constants with text descriptors
- SkyServer Schema Browser provides:
  - Tables, Views, Functions
  - Description of each
  - Contents of each listed
  - Functions to go between symbolic and literal constants

Technical Goals

- User Interface
- Standardized Data Access
- Distributability
- Security

User Interface

- HTTP-based
  - All SkyServer interfaces HTTP-based
- ASCII interface to query support layer
  - SQL interface
- Data returned in ASCII, HTML, XML
  - SkyServer and sdssQA support all three
- User interface shall be documented
  - SkyServer Help pages
  - sdssQA Help pages and tutorial
  - SQL Intro pages, sample queries

Standardized Data Access

- OSQL-like interface to DB to enable alternate view/access via commercial products
  - OSQL standard doesn't exist
  - Performance/features not satisfactory
    - Been there, done that!
- Industry-standard SQL access
  - Any SQL client can access data
  - SQL more versatile than OSQL

Distributability

- A master copy of all data shall be maintained
  - Master Science Archive (MSA) at FNAL or JHU
  - Mirrors at various locations
  - Backup strategy
- Ability to replicate all or part of the MSA
  - Science Database in its entirety
  - All or part of separate files tracked by DB
    - These can be retrieved via queries
    - No way currently to mirror subset of DB

Security

- Protection against corruption by SDSS users
  - Use of commercial DB ensures protection
- Protection against unauthorized access by non-SDSS participants
  - DB server not directly accessible
  - Access only via web (HTTP) interface
  - Web pages IP-restricted or password-protected
- Computer security policies and procedures of the institution hosting the Master Science Archive shall be followed